

Systemair d.o.o. – Špelina ulica 2, SI-2000 Maribor

Tel.: +386 2 46 01 801 – Fax: +386 2 46 01 803

info@systemair.si – www.systemair.com

DVG-V-EC / DVG-H-EC
F200, F300, F400 EN 12101-3 (400°C, 120 Min.)



DVG-V-EC/F400

DVG-H-EC/F400

GB

Instructions for transport, installation, commissioning and maintenance of roof fans DVG-EC

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Appendix:

- 1 - Mounting of service switch/Mounting of vertical outlets for DVG-V
- 3, 4 – Accessories – mounting
- 5 – Bridge for fire mode in controller
- Controller “Compacto” – instructions
- Controller “Invento” - instructions

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Attachment:

- Test protocoll
- Instruction of electric motor
- EC declaration of conformity

1.0 APPLICATION

Smoke extract roof fans are designed for use in powered smoke and heat exhaust ventilating systems in the event of fire, and ventilating in normal conditions. Ventilated areas and emergency exits contribute to easier evacuation of people and equipment in the event of fire, and to faster and more efficient fire extinguishing; they protect the building structure and equipment against excessive temperatures and decrease fire escalation to the surrounding areas.

- Fire resistance of fans: 400C, 120 min;
- installation on roofs over heated buildings;
- horizontal outlet (DVG-H) or vertical outlet (DVG-V);
- EC-motor outside air stream;
- daily ventilation of medium with temperature from -20 up to 120°C, supposing continuously operation, up to 80°C in standstill;
- the fans DVG must not be mounted in explosion hazardous zones;
- 0-10V speed control input;
- Modbus controllable;
- Fire mode to disable motor and controller protection in case of fire.



Not intended or unprofessional use can be dangerous for life of user or third person. It can lead to damage of the fan. The risk for this carries the operator alone.

2.0 TECHNICAL DESCRIPTION

Casing

Electric motor with impeller is fastened to a sturdy supporting construction. The casing cover is made of see water resistant aluminium.

Impeller

Impeller of DVG fan is manufactured from galvanized steel. It is fastened with taper bush and secured screw directly on to the motor shaft. Dynamically balanced in accordance with ISO 1940 T1, class G6,3.

Electric motor

Fans are serial equipped with EC (electronically commutated) high efficiency electric motors for single-phase current 200 to 265V, 50/60Hz Hz (sizes 355 and 450), rsp. 342 to 506V, 50/60Hz Hz (sizes 560, 630, 800). Protection class IP 54. Insulation class F.

Factory preset 230V, 50 Hz rsp. 400V, 50 Hz. Max. RPM: 1400 to 1500 RPM, depending on model, rsp. 850 RPM at DVG 800.

Detailed description of controller connection and control possibilities please see in attached instructions of controllers.

3.0 TRANSPORT AND STORAGE

3.1 Transport

Fans are delivered in wooden crates or cardboard boxes. It is recommended to leave the fans in original packing during transport to the place of installation as well as to load and unload them carefully to avoid any possible damage. The fans must be transported in a

horizontal position only. During transport and loading/unloading the weight of the fan must be considered.

On receipt the fan must be visually inspected, and the shipment must be checked for proper quantity.

3.2 Storage

Store the fans in a dry, weather and dust protected place. If this is impossible, it is important to raise the fan above the ground surface and cover it with a PE foil.

4.0 INSTRUCTIONS FOR INSTALLATION

4.1 Inspection before installation

Each fan is controlled by the manufacturer before delivery.

After unpacking and before installing, check the following:

- if any eventual damage occurred during transport;
- mounting of service switch and vertical outlets (DVG-V only) up to Appendix 1;
- check by hand if impeller is rotating smoothly.

4.2 Safety instructions for installation, commissioning, maintenance and controlling



Installation and electrical connection must be accomplished only by authorized technical personnel and in agreement with the valid regulations.



Any hazard of unintended touching the impeller (risk of injury!) has to be prevented (with a duct long enough or a protective guard)!

Commissioning is allowed only after installation into the ventilation system or after installation of protective guard (EN 13857). After installation impeller must not be accessible anymore.

During installation, commissioning, maintenance and controlling, unauthorized personal should not have access to the fan and installation place.

Any risk of unintended start-up of the fan and any risk of touching the impeller during above mentioned works has to be excluded (switch off the fan and exclude possibility of unintended start-up).

Before removing the casing cover, protective guard on the pressure side or an eventual protective guard on the suction side make sure the fan is separated from the mains supply.

Common rules for safety work have to be strictly observed.

4.3 Installation of the fan

- Fans type DVG should be installed outside fire zones (on roofs over heated buildings);
- Fans DVG must not be mounted in explosion hazardous zones;
- Before installation check the carrying capacity and stability of the roof;
- Fans must be installed upright in a vertical position (shaft vertical) and raised above the roof surface on a base with minimum height of 250 mm (respectively according to expected snow height);
- The fan shall be fixed to the base with 4 screws on the corners;
- The fan housing should not be deformed during mounting;

- Check, if impeller rotating smoothly;
- Access to the fan for maintenance must be assured.



At installation the dimensions of the fan and possible extension of parts by the temperature rise has to be considered (provide flexible connection of appropriate temperature/time class)!

4.4 Instructions for installation

Air ducting system

The suction side of the fan is provided with a connection for flange-type mounting of the air duct (6 resp. 8 bolts M8 on the base plate). It is recommended to mount fire proof flexible connections between fan and duct to avoid tension or deformation of the fan base. Flexible connection should meet temperature/duration class as well as the under pressure at operation of the fan. In each case smooth rotation of impeller must be insured.



Any risk of unintended start-up of the fan and any risk of touching the impeller during above mentioned works has to be excluded (switch off the fan and exclude possibility of unintended start-up).

Connection of the fan to the mains



Electrical connection has to comply with valid local regulations and must be accomplished only by a qualified electrician. In case of unprofessional connection guarantee will not be valid. The risk for this carries the operator alone. Observe attached detailed instructions of motor and controller supplier – since EC motor built-in, there are warnings for remaining voltage after supply switched off. Type of permitted RCD protective devices observe local regulations.

Power supply to motor has to be executed in the service switch placed on the fan. Electric motor is pre-wired with controller. Control cables should be led through the black tube to controller. To get to controller dismount the upper cover of the fan.

For control possibilities please see attached instructions of motor and controller supplier.

1~ unit: instructions of controller “Compacto”

3~ unit: instructions of controller “Invento”



The quality and installation of cables for electrical connection must ensure uninterrupted energy supply, also in case of fire. The electric cable must not touch or be fastened to the casing of the fan (high temperature!). If danger of unintended switch off of service switch, it should be locked to guarantee operation in fire case. Drill hole in position “on” into handle and provide with a padlock (not supplied with the fan).



Electrical data on the fan nameplate have to comply with the provided mains connection. Motor protection has to be provided by the installer.



If fan used for smoke and heat extract in case of fire switch to fire mode (max. speed, disabled protection of controller and motor) and bridging of motor protective devices is necessary to assure operation.

Switching on max. speed even after eventual short supply cut off must be assured. Operating over 1400 to 1500 RPM (size 800: 850 RPM) is not allowed.

5.0 COMMISSIONING

Before initial operation, read through appropriate instructions and check the following:

- Assembling of the fan (fixing, eventual deformations);
- Check all joints for leakage;
- Check if foreign objects were left in the fan or in the connected ducts;
- Check if protective elements are fitted;
- Check the accuracy of the electric wiring and connections to the mains.

Then start the fan for a short period and switch it off again to check the direction of rotation. It has to comply with the direction of the arrow on the casing of the fan. Check it for proper operation (smoothly rotating impeller, current, eventual vibrations, noise).



Protective glasses are needed to avoid any injury of the eyes.



Fill in attached control report and file it.

6.0 APPROVAL



It is particularly important to prove the proper function of system and control devices as well as compliance with requirements of the project and regulations.

When the system is approved, file the reports. Make sure that only authorised personnel can handle with on/off switch.

7.0 MAINTENANCE AND PERIODIC CONTROL



Unintended start-up during installing, controlling, maintenance or repair of the fan has to be prevented!

The following must be controlled periodically (once a year):

1. Check if screws between impeller and hub got loose and tighten them if needed;
2. Tighten the screw between wheel hub and shaft if needed;
3. Remove dirt from the fan impeller if there is any;
4. Check the functionality of protective devices;
5. Check the functionality of control devices;
6. Current during operation;
7. Eventual vibrations;
8. Noise which might appear in el. motor bearings.

The function of the system and control devices has to be checked according to system maintenance book, minimum every 3 months. Operation at least 15 minutes each time, once a year 3 hours recommended, if possible.



Checking points 1 to 4 can be done only if the supply voltage is switched off and possibility of unintended start-up is excluded.

Parameters of points 5 to 8 must not deviate from the starting values (at installation). In case that parameters deviate, the electric motor or the impeller have to be replaced or repaired. This must only be done by an authorised customer service, otherwise the manufacturer's guarantee is invalid.

The electric motor has to be maintained according to the attached instructions of the manufacturer of the electric motor.

8.0 SYSTEM MALFUNCTIONS DURING OPERATION

For all inspections, point 4.2. must be considered.

Possible malfunctions and solutions:

The fan does not operate	Check connection to the mains in service switch. If ok. check connection to controller.
Air volume is too low	Check operating point and system design.
Under-, overvoltage, overheating, overcurrent, locked rotor etc.	Please see chapter "Troubleshooting" in the instructions of controller.
Noise	Damage to the bearings, impeller blocked or touching the casing. Get the electric motor or if necessary the complete fan repaired.
Vibrations	Check operating point and system construction. If the actual pressure drop of the system is higher than supposed, the fan could operate in an instable area of the fan curve. Inform customer service of the

	manufacturer.
	Damage or dust layer on impeller. Clean the impeller, if necessary balance it or replace it.

If the reason for the malfunction can not be clearly determined, inform the customer service of the manufacturer.

After a case of fire the fan must be checked by the manufacturer.

9.0 GUARANTEE

Guarantee will be valid only if transport, storage, installation, connection and periodical maintenance have been executed in compliance with the above instructions and local regulations regarding electric installation and fire protection. For validity of the guarantee duly filled and signed control report has to be submitted.



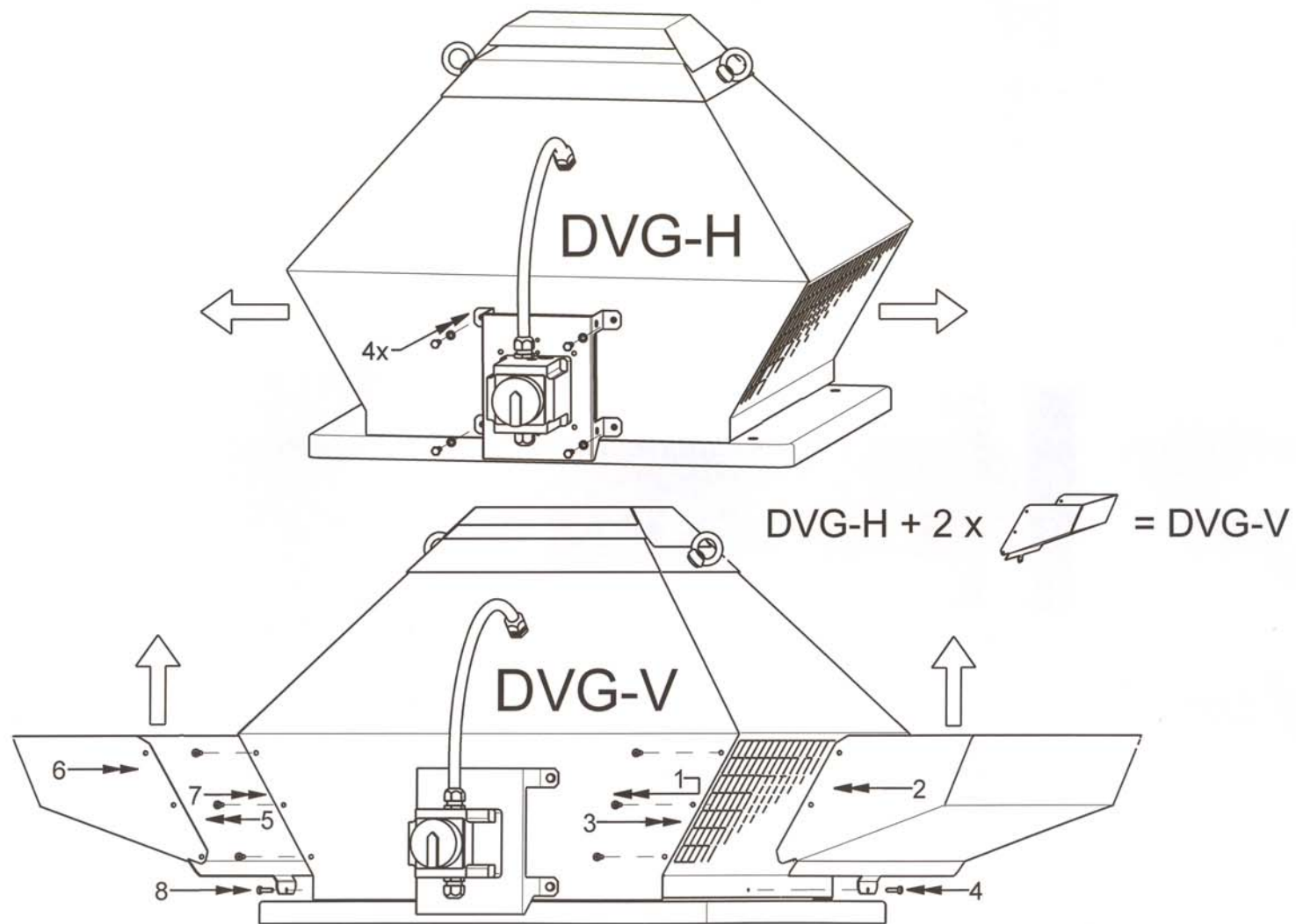
It is very important that the installation of the fan is done with all necessary care, to ensure uninterrupted and safe operation.

Anlage 1. Montage des Revisionsschalters / Montage der Umlenkungsbleche bei DVG-V

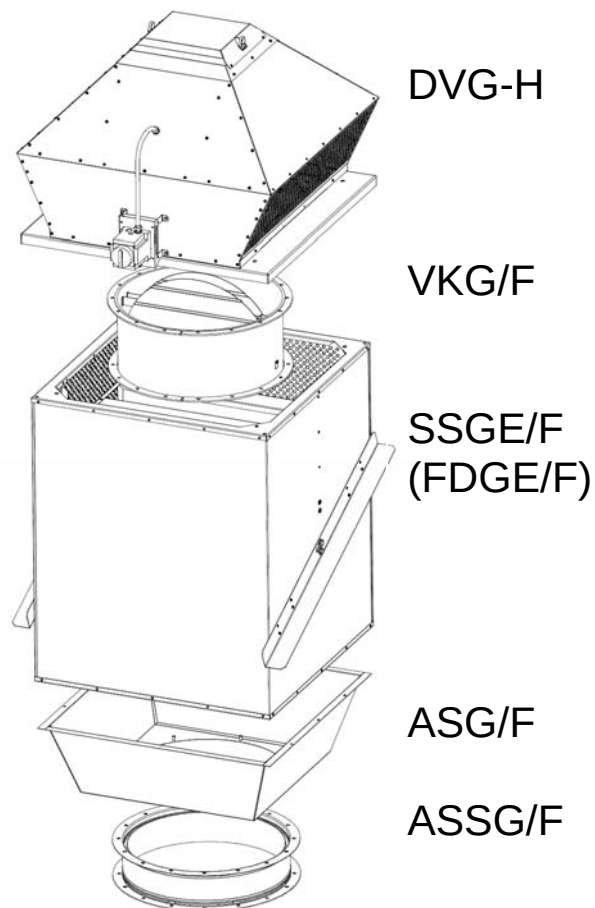
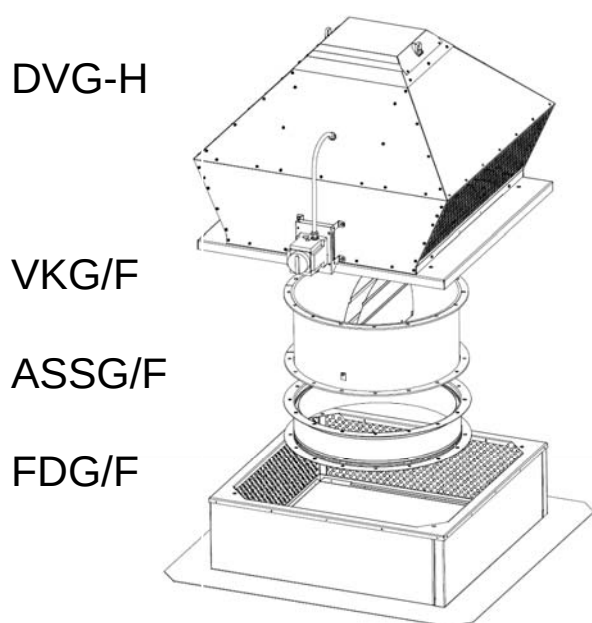
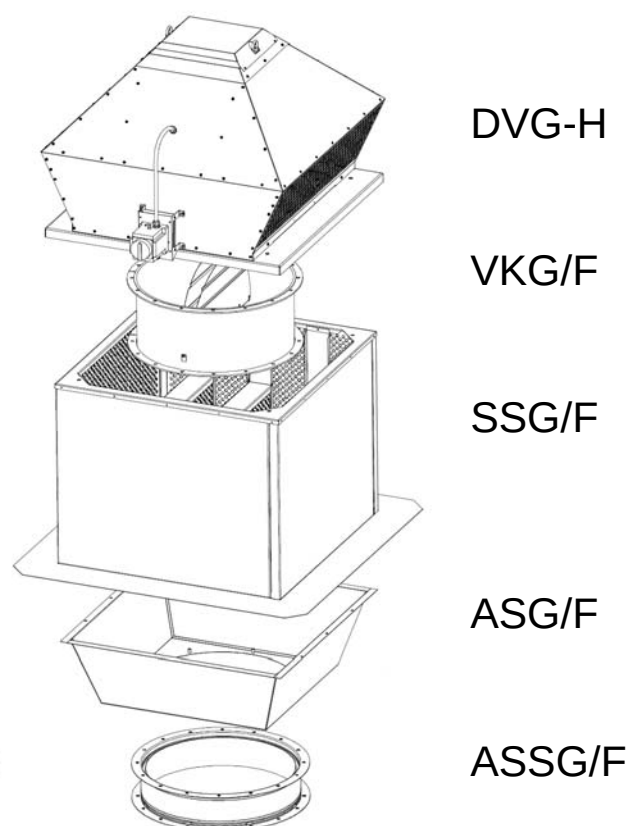
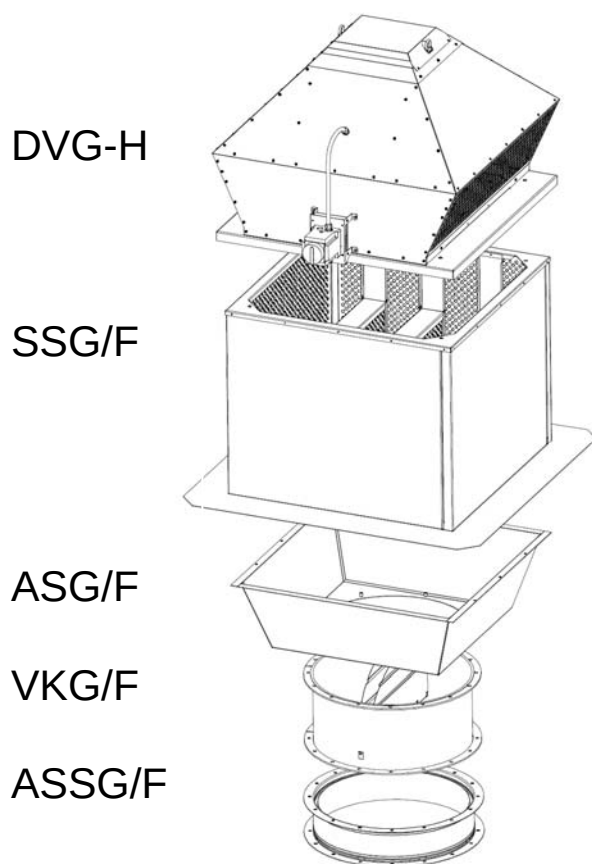
Appendix 1. Mounting of service switch / Mounting of vertical outlets for DVG-V

Bilaga 1. Beslag av tjänste- kopplar/beslag av lodlinjeuttag för DVG-V

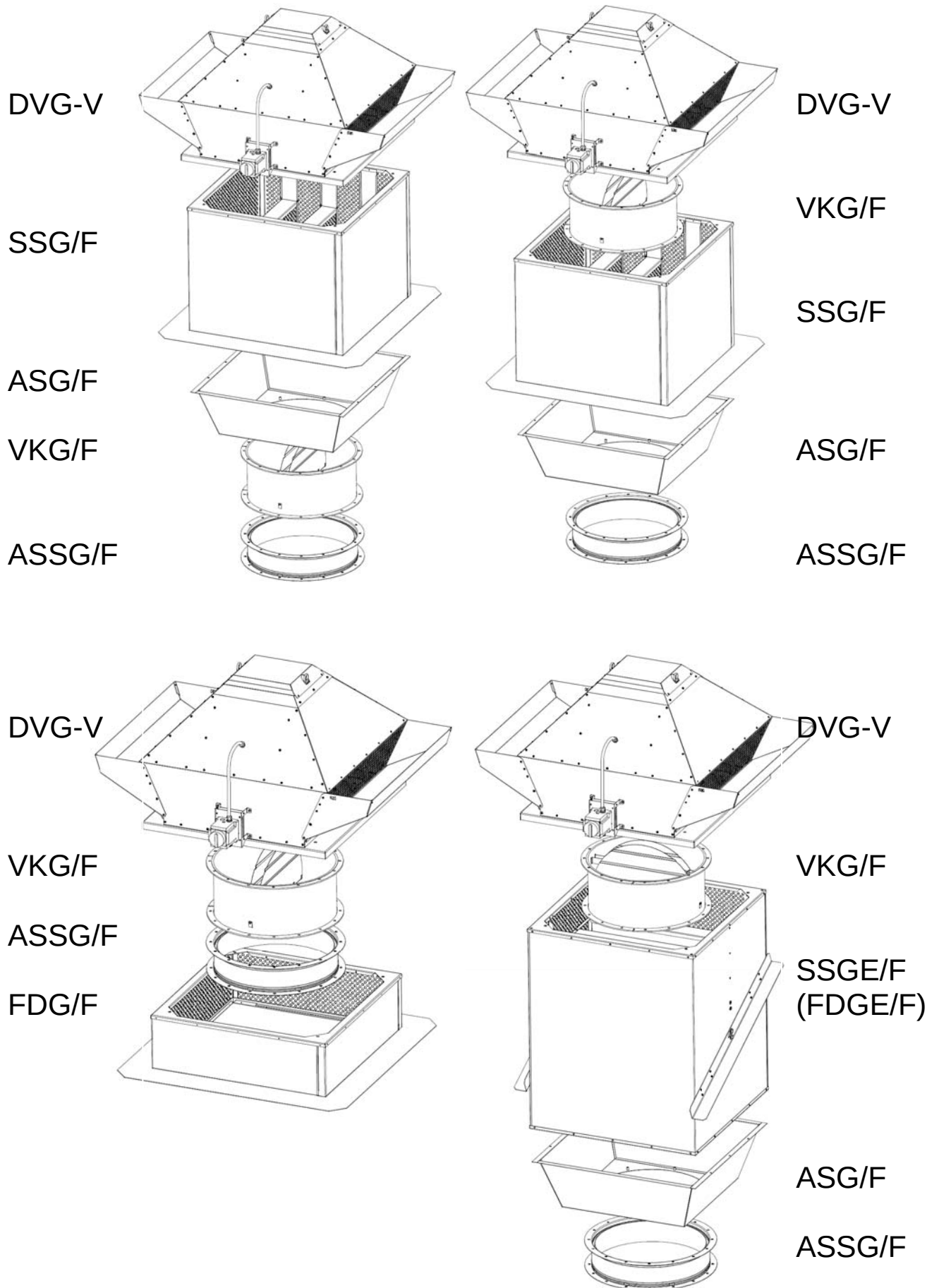
Приложение 1. Пусковое устройство - монтаж / Вертикальный выброс - монтаж



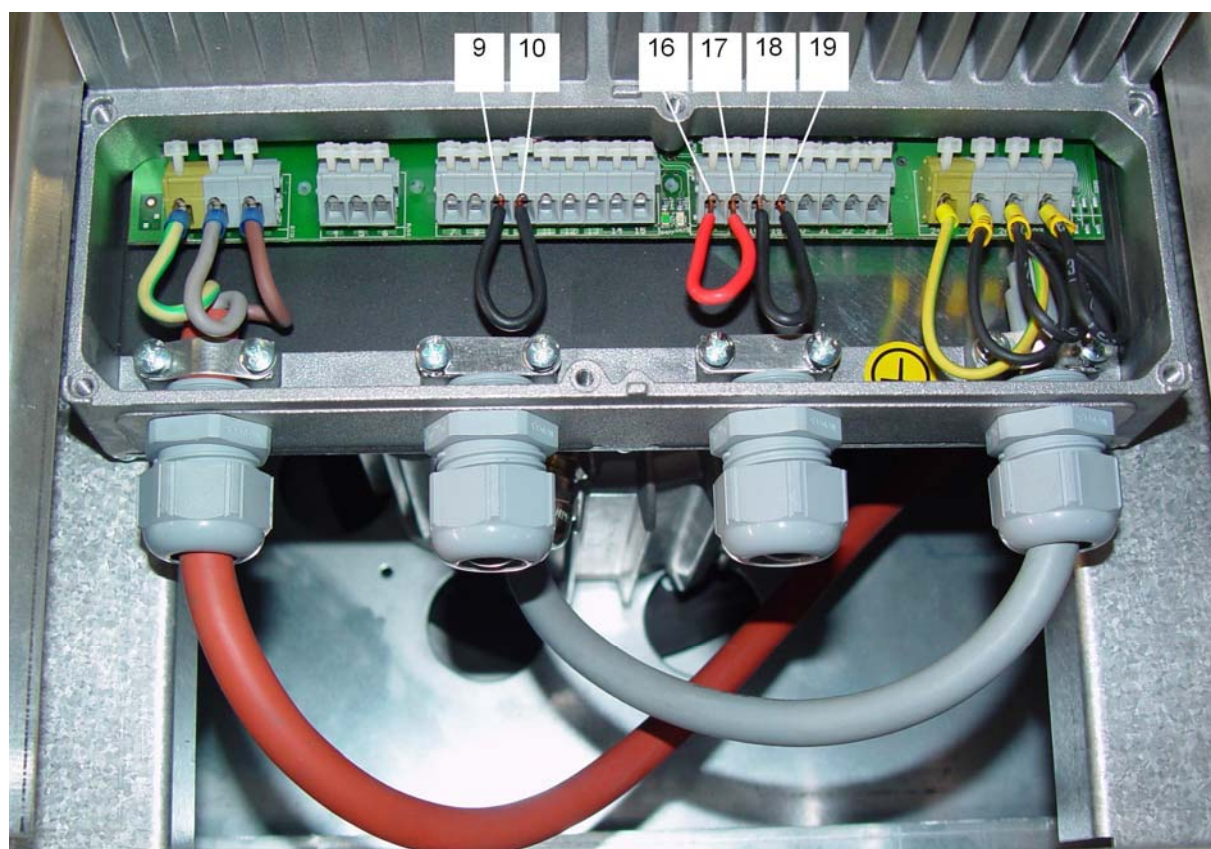
Anlage 3. Zubehör - Montage
Appendix 3. Accessories – mounting
Bilaga 3. Tillbehör - installation
Приложение 3. Принадлежности - монтаж



Anlage 4. Zubehör - Montage
Appendix 4. Accessories – mounting
Bilaga 4. Tillbehör - installation
Приложение 4. Принадлежности - монтаж



Appendix 5. – Bridges in controller (1~ controller on the photo)



Bridges are factory inserted to allow test of fan without connecting control cables.

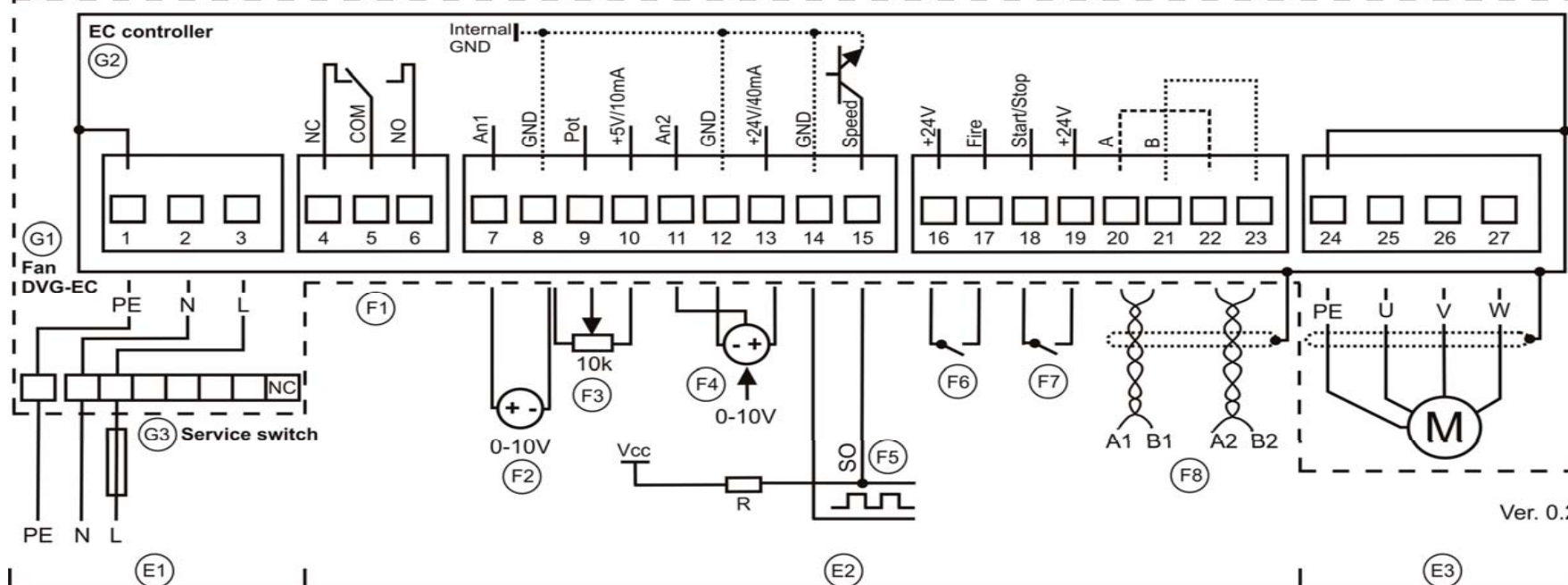
In case of using the fan for smoke and heat extraction, remove the red bridge 16-17 (fire mode) and connect controller to fire central up to wiring scheme (10-11 at 3~ controller).

Replace bridge 9-10 (6-7 at 3~ controller) with potentiometer for speed setting or remove it, if using AN1 input.

Replace bridge 18-19 (11-12 at 3~ controller) when using start –stop switch.

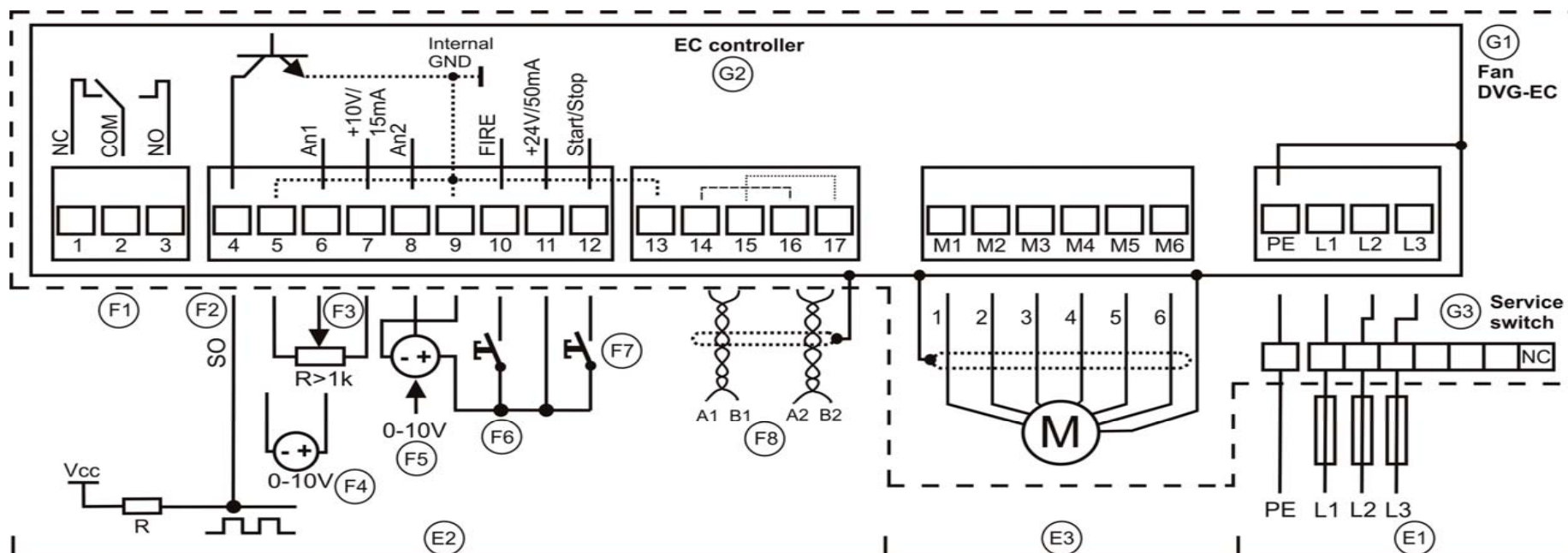
	Marking	Terminal No.	Description
Mains supply	PE	1	PE connection
	N	2	
	L	3	Supply voltage 1~ 230V/50-60Hz
Fault relay	NC	4	Normally close
	COM	5	Common connection; contact rating 250V/5A
	NO	6	Normally open
User interface	An1	7	Analog input 1; set value 0-10V; R >= 1kΩ
	GND	8, 12, 14	I/O ground
	Pot	9	Potentiometer output (3 wires)
	+5V	10	+5V +/- 5% / 10mA for potentiometer
	An2	11	Analog input 2 for external sensor
	+24V	13, 16, 19	+24V +/- 5% DC (unregulated) voltage / I _{max} 40 mA
	Speed	15	Digital output; speed output PWM signal f ~ 1,1 kHz; NPN open collector output
	Fire	17	Digital input; FIRE mode enabling function - open pin disabling function - bridge to +24V
	Start/Stop	18	Digital input; FIRE mode enabling function - open pin disabling function - bridge to +24V
	A	20, 22	Bus connection RS485 - A; MODBUS RTU
	B	21, 23	Bus connection RS485 - B; MODBUS RTU
Motor connection	PE, U, V, W	24, 25, 26, 27	Motor pre-wired

Symbol	Description
G1	Fan DVG-EC
G2	EC controller
G3	Service switch ON-OFF, 6 pole + 1xNC
F1	Fault relay
F2	Analog input for set value / speed setting
F3	Potentiometer for speed setting
F4	External sensor
F5	Speed output
F6	FIRE mode (open = FIRE)
F7	Start /Stop switch (open = stop)
F8	Bus connection
E1	Power supply - connection in G3 Max. cable crosssection: 2,5 mmq (4 mmq without core end sleeves) Max. cable diameter: 13 mm Cable gland on supply side included: 1xM20x1,5 Possible to install additional cable glands 1xM20x1,5, 1xM16x1,5
E2	Control cables - connection in G2 Max. cable crosssection: 1,5 mmq Max. cable diameter: 13 mm Cable glands on controller: 2xM20x1,5 Protecting tube to provide control cables: inside diameter 15,5 mm, connection M20x1,5 male thread
E3	EC-Motor pre-wired



	Marking	Terminal No.	Description
Fault relay	NC	1	Normally close
	COM	2	Common connection; contact rating 250V/3A
	NO	3	Normally open
User interface	Speed	4	Digital output; speed output PWM signal; f ~ 1,1 kHz; NPN open collector output
	GND	5, 9, 13	I/O ground
	An1	6	Analog input 1; set value 0-10V; R >= 1kΩ
	+10V	7	+10V +/- 5% / 15mA
	An2	8	Analog input 2 for external sensor
	Fire	10	Digital input; FIRE mode enabling function - open pin disabling function - bridge to +24V
	+24V	11	+24V +/- 5% DC / I _{max} 50 mA
	Start/Stop	12	Digital input; FIRE mode enabling function - open pin disabling function - bridge to +24V
	A	14, 16	Bus connection RS485 - A; MODBUS RTU
	B	15, 17	Bus connection RS485 - B; MODBUS RTU
Motor connection	M1-M6	M1-M6	Motor pre-wired
Mains supply	PE	PE	PE connection
	L1, L2, L3	L1, L2, L3	Supply voltage 3~ 400V/50-60Hz

Symbol	Description
G1	Fan DVG-EC
G2	EC controller
G3	Service switch ON-OFF, 6 pole + 1xNC
F1	Fault relay
F2	Speed output
F3	Potentiometer for speed setting
F4	Analog input for set value / speed setting
F5	External sensor
F6	FIRE mode (open = FIRE)
F7	Start /Stop switch (open = stop)
F8	Bus connection
E1	Power supply - connection in G3 Max. cable crosssection: 2,5 mmq (4 mmq without core end sleeves) Max. cable diameter: 13 mm Cable gland on supply side included: 1xM20x1,5 Possible to install additional cable glands 1xM20x1,5, 1xM16x1,5
E2	Control cables - connection in G2 Max. cable crosssection: 1,5 mmq Max. cable diameter: 13 mm Cable glands on controller: 2xM20x1,5 Protecting tube to provide control cables: inside diameter 15,5 mm, connection M20x1,5 male thread
E3	EC-Motor pre-wired



DVG 560-EC, 630-EC, 800-EC - Wiring 3~, 400V, 50/60Hz

11.10.2012